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Cropping with Conservation Tillage in the Southeast

Why Does it matter?

Drought is very common during critical crop growth periods in the humid Southeast. Losses of drought for nine major crops for the 2000 cropping season in Georgia alone were estimated to be 39% of normal crop production with the losses valued at $689million. Many producers use conventional tillage methods such as plowing, disking and harrowing which destroy soil properties favorable for sustainable cropping and exacerbate drought problem. Conservation tillage, on the other hand, has minimal disturbance of the soil surface and builds soil organic matter which helps soil to aggregate and build structure, and increase biological activity. The net effect is increased infiltration, reduced evaporation, better soil water availability, and better nutrient cycling. Conservation tillage ought to be considered as part of the arsenal of tools used for regional and statewide water resource conservation planning.

What was done?

Conservation tillage and conventional tillage were compared for yield of cotton and corn (five years each), on a Cecil soil, one of the dominant soils in the Southeast. A rye cover crop was used in both. Runoff, drainage, and sediment load were also compared during a wet year of the cotton period.

What was found?

Conservation tillage enhanced lint yield by 33% over 5 years. Average yield enhancement in the two dry years out of five was 36%. Corn yield increased by an average of 11% over five years under conservation tillage. Greater infiltration and conveyance of water to the deeper soil profile in conservation tillage enhanced water availability – drainage was about 2.8 times more under conservation tillage while runoff was about 2.6 times more from conventional tillage during the cotton. There was almost 3 times more sediment loss in runoff from the conventional tillage.

What is the impact?

Only about 48% of the 6.7 million acres of corn and about 22% of the almost 12 million acres of cotton in the South were planted in conservation tillage in 2004. We estimate that conservation tillage currently reduces irrigation needs by as much as 12% in Georgia. There is thus a great potential for adoption of conservation tillage in the South to enhance agricultural economic return and as a cost-effective means to conserve regional water resources in both dry land and irrigated agriculture. Unlike irrigation, an option used to reduce risk of loss form drought, conservation tillage is feasible in most situations, requires little or no capital investment, and is not constrained by competing socio-economic interests.

Research Team and Contact information

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